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TRAIL & LANDSCAPE



*A Publication Concerned With
Natural History and Conservation*

The Ottawa Field-Naturalists' Club

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TRAIL & LANDSCAPE

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The Ottawa Field-Naturalists' Club

— Founded 1879 —

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Objectives of the Club: To promote the appreciation, preservation and conservation of Canada's natural heritage; to encourage investigation and publish the results of research in all fields of natural history and to diffuse the information on these fields as widely as possible; to support and co-operate with organizations engaged in preserving, maintaining or restoring environments of high quality for living things.

Club Publications: THE CANADIAN FIELD-NATURALIST, a quarterly devoted to reporting research in all fields of natural history relevant to Canada, and TRAIL & LANDSCAPE, a quarterly providing articles on the natural history of the Ottawa Valley and on club activities.

Field Trips, Lectures and other natural history activities are arranged for local members; see "Coming Events" in this issue.

Membership Fees: Individual (yearly) \$28 Sustaining (yearly) \$50
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Table of Contents

Welcome, New Members	2
The Louise de Kiriline Lawrence Conservation Action Fund/ <i>Frank Pope</i>	3
Conservation Matters/ <i>Stan Rosenbaum</i>	5
FON Notes/ <i>Frank Pope</i>	7
Peregrine/ <i>C. Lewis</i>	8
The 1999 Peregrine Watch/ <i>Eve Ticknor</i>	9
The Much Maligned Starling/ <i>Jack Holliday</i>	13
More Red-eared Sliders in the Ottawa District/ <i>Stephen Darbyshire</i>	15
A Key to Adult Damselflies of the Ottawa District/ <i>John Sankey</i>	17
Present Things/ <i>Marianne Bluger Neily</i>	28
The Tadpole Madtom, <i>Noturus gyrinus</i> / <i>Anne Phelps, François Chapleau & Claude B. Renaud</i>	30
Navigating as Naturalists With the Global Positioning System/ <i>Frederick W. Schueler</i>	35
Coming Events	41

Welcome, New Members

Ottawa Area

Marie-Paule Baranowski
Lorraine Boulay
Zoe Cation & family
Valerie Clement
Carol Connolly & family
Lucie De Blois
Heather Garwood
Christine Grace & family
Catherine Horner & family
Jeannette & Phillip Jeffreys
Pierre Landry
Michael McKenna
Colin Nicholson & family
Anne-Marie Phelps
Adrienne Sinclair
Peter Stockdale & family
Pam Stone & family

Other Areas

Jackson Whitman, Sitka Alaska



Dave Smythe
Membership Committee
November 1999

The Louise de Kiriline Lawrence Conservation Action Fund

Frank Pope

Some of you, particularly new members, may have wondered if the Club has a fund dedicated to support the conservation of natural areas, one to which donations are tax deductible. It does indeed.

Established by the Council of the Ottawa Field-Naturalists' Club on March 14, 1994, the Louise de Kiriline Lawrence Conservation Action Fund was created to provide for strategic and timely expenditures toward the conservation of natural areas. Ms. Lawrence, an Honorary Member of the Club, was known for her popular writings which were based upon an understanding of nature gained from scientific observation and analysis of the world around her.

The initial deposit to the fund came from a bequest of \$6,627 from the Lawrence estate. Subsequently it was increased from the following sources:

- proceeds from the sale of "Nature and Natural Areas in Canada's Capital" by Daniel F. Brunton
- donations to OFNC specified for conservation purposes donations to the OFNC not specified for any other purpose, as approved by the Council
- proceeds from the sale of OFNC items, as approved by the Council.

Over the past four years, the amount of the original bequest has been augmented by contributions from all of the sources listed above. At September 30th, 1998, the fund stood at \$27,221. Should members wish to be sure that their donation at membership renewal time, or any other time, be used only for conservation purposes, they should be careful to specify that it is for "conservation." This will route the donation to the Louise de Kiriline Lawrence Fund.

Disbursements from the fund are made upon approval of the Council. Some examples of the kind of strategic and timely expenditures deemed eligible when the fund was established are:

- legal fees to support court challenges when natural areas are threatened
- expert witnesses and presentations

- field studies where more information on a natural area is needed
- publishing of relevant information that would not otherwise be available

The following disbursements have been made to date.

- In November 1995, to support our defence of the Lietrim Wetland we paid \$1,600 to an expert witness on hydrology.
- In March 1996, to support the Ontario Environmental Network, which was in danger of collapse, we contributed \$500.
- In August 1998 to support a legal challenge to the establishment of a water park on Watts Creek, we paid \$1,000 to the Association to Save Our Greenbelt (ATSOG).
- In November 1998, as our contribution to *Lands for Life*, we spent \$730 to copy and mail information to all members residing in Ontario, and to sponsor a public meeting.
- In December 1998, to support the acquisition of Gillies Grove in Arnprior we contributed \$1,000.
- In October 1999, to support the purchase by the Federation of Ontario Naturalists of a threatened alvar on Manitoulin Island, we contributed \$1,000.

References:

- Louise de Kiriline Lawrence Conservation Action Fund, The Ottawa Field-Naturalists' Club. 1994. *The Canadian Field-Naturalist* 108 (1): 110.
- Pope, Frank. 1993. Bequest from the Estate of Louise de Kiriline Lawrence. *T&L* 27(1):3. □

Conservation Matters

Stan Rosenbaum

November 1999

The Manitoulin Alvar Lands

In September the FON announced that the joint campaign to acquire 17,000 acres of land on Manitoulin Island was in urgent need of extra money. The OFNC contributed \$1,000 to the campaign, despite its great distance from Ottawa, (a long way beyond our traditional "50 Km radius") on account of the high ecological value of this relatively undisturbed alvar land in Lake Huron. The FON has informed us that the acquisition is proceeding. In this case, as in many others, matching grants by several levels of governments greatly increase the value of non-governmental donations.*

Goulbourn Township and the Richmond Conservation Area

A Club member, Jack MacKenzie, who sits on the Goulbourn Environmental Advisory Committee, informs us that most of their energy has been absorbed by a frustrating and fruitless effort to protect natural features, first trees and now a 19 acre wetland swamp, that are adjacent to a high school/recreation complex under construction on the eastern border of Stittsville. On a more positive note, Goulbourn has reached agreement with the Regional Municipality on the status of the Richmond sewage lagoons. The lagoons are known as cells A, B and C. Cell C flows into B, which then flows into A. The Region is to retain control of cell C for potential emergency sewage overflow, and cells B and A will become a nature reserve. At last report, the Region had not yet signed the agreement.

Alfred Bog

As chairman of the Alfred Bog Committee, Frank Pope conducted meeting number 26 of that committee on October 14 in Alfred.

Endangered species legislation

One of the principal organizations pressing for effective legislation on endangered species is the Canadian Nature Federation, with whom the Club is affiliated. Headquartered in Ottawa, the CNF feels somewhat isolated from

* In case you would like to know how our Club keeps funds on hand for purposes such as this, see the article on Louise de Kiriline Lawrence Fund, p. 3 this issue. At membership renewal time – or in fact at any time – you can donate money specifically to this fund and get a tax receipt for it.

contact with the general public. Hence, the Coordinator of the Endangered Species Program, Marc Johnson, was very pleased to have the opportunity at the Club's monthly lecture meeting at the Canadian Museum of Nature on November 9th to say a few words about upcoming federal legislation, and to ask people in the audience to contact several influential cabinet ministers as well as local MPs in support of Environment Minister David Anderson's Parliamentary Bill.

Gillies Grove (Arnprior)

The battle in Arnprior to preserve Gillies Grove moved significantly closer to success recently, when the organizers of the campaign (the Land Preservation Society of the Ottawa Valley) were able to announce that enough money (\$400,000) had been raised to complete the purchase of this magnificent stand of old-growth white pines. However, at last report there remained an obstacle, in the form of a condition attached by the owners of the property (the Dominican Order) that the City of Arnprior rezone some adjacent lands for development. Last year the Club made a contribution of \$1,000 to the campaign, (in effect such donations are more than doubled by their symbolic value in attracting government and corporate grants) and asserted the value of preserving Gillies Grove in a letter to the Mayor of Arnprior: "..... The town of Arnprior is extremely fortunate to have Gillies Grove within its boundaries. What other town can boast such a remarkable natural legacy? Whether used as a quiet place to walk, a place to study nature, or as a living outdoor classroom, it offers inestimable benefits. Where else can we go to see what the original forests of the Ottawa Valley were like?"

Petrie Island

Two Club members – Christine Hanrahan and Stephen Darbyshire – have continued to help the Friends of Petrie Island in the preparation of interpretive material, and in personally conducting visitors on guided tours. Petrie Island has logged close to 20,000 visitors this summer.

The Friends of Gatineau Park

A new organization: The Friends of Gatineau Park, held its inaugural meeting on October 26th. The new group is a cooperating, non-profit organization that will work with park management to help foster the understanding, appreciation and protection of the natural and cultural values of the park. Individuals are invited to become members, and in this way keep informed, as well as contributing to the park's preservation. The membership fee is a very modest \$6. To join, or for further information, write to: Friends of Gatineau Park, P.O. Box 699, Chelsea, Quebec, J0X 1N0, e-mail to: cameron@cyberus.ca or visit the Friends on the internet at <http://www.ccite.com/amicigatineau.htm>

FON Notes

Frank Pope

The Regional Council of the Federation of Ontario Naturalists met on September 25th, 1999, in Perth. It was attended by three FON staff and twenty people from local clubs, including four from Ottawa (the president, two vice-presidents and me).

As usual we began with a round table in which each club representative reported on recent activities and we discussed accomplishments and challenges. Two naturalists from Tweed described their efforts to start a club there, beginning with an invitation to all FON members in their area to join. A few people responded.

After lunch two local issues were presented. Mark Stabb brought us up-to-date on the attempt to purchase Gillies Grove in Arnprior. They have enough money to acquire the woodlot but not the house which has been designated a heritage property by Heritage Canada. The final stages in the acquisition procedure have been difficult because of a deal that involves a re-zoning of property next to the grove for high density housing, hardly a good prospect for the grove. Furthermore, additional funding is required to complete the purchase and manage the grove. (On a personal note, I recommend a half day excursion to the grove followed by lunch and shopping in Arnprior). The second local issue was Alfred Bog. Leo Durocher of the Vankleek Hill Nature Society and I made a presentation. I will report on Alfred Bog in the next issue of *T&L*.

Ric Symmes, the Executive Director of FON, spoke of their accomplishments in the *Lands for Life* process and then outlined the work needed to implement the Ontario Forest Accord and Living Legacy, two programs which grew out of *Lands for Life*. He noted that they find themselves caught between industry spokesmen who criticize the government for giving away too much and naturalists who criticize FON for compromising on its goal of preserving over 20% of the land.

Sandy Symmes and Andrea Kettle of FON spoke about the availability of money from the Trillium Fund to produce seven regional newsletters and, possibly, workshops on volunteer management/fundraising and strategic communication/marketing.

Peter Goddard gave an overview of a successful FON camp for junior naturalists last summer and the need to reach more young people with our message.

The next meeting is scheduled for April 15, 2000. □

Peregrine

C. Lewis

Molten sunrise, smoldering sky
questioning calls of restless geese
reeds in dark water ripple and sigh
– suddenly the uneasy peace
erupts in a volcanic burst
of tapered wings in powered flight,
only a streak of black speed at first,
then a twist of pursuit
brings him into the light.

His quarry's elusive, his focus intense:
a passion play, the thrill of the chase
stirring emotions – I lose all sense
of reality, of time and place...

Another heartbeat – and he is gone
nothing remains but the punctured air
where his after-image lingers on
and only the wind's even sure he was there.

The 1999 Peregrine Watch

Eve Ticknor



Peregrine Falcon, drawing by Chris Lewis.

What an exciting, not to mention stressful, season we have had with our Peregrine family this year!

Again we feel "our" adult pair are the same as in the last two years. Peregrines tend to return to the same nest site if they perceived their previous nesting season to have been successful, which means brooding eggs and raising chicks, even if the chicks raised didn't hatch from eggs laid by the brooding parents!

This year we were able to follow nesting activities by camera and monitors, courtesy of the Canadian Peregrine Foundation, at their "Falcon Suite" (air conditioned!). Thank you, Mark Nash and the CPF.

In order to build on what we had learned the previous two years, and to accommodate the increasing work load, we formed a Peregrine Committee under the auspices of the Ministry of Natural Resources (Daryl Seip) and the Birds' Committee of the Ottawa Field-Naturalists' Club, to enlist volunteers ready to keep a watch over the developing chicks.

We were fortunate to have two ladies from last year's watch to share the position of Volunteer Coordinator. Mary Ellen Arseneault and Terry Higgins made all the difference in the world! Working with a solid base set up by Bev McBride from the previous year, they were in contact with each volunteer, set up shift schedules and scrambled to change shifts for those whose work schedules or cruises were changed, or who experienced illnesses or deaths in their families. All this, with no specific "start" date yet, involving more than 70 volunteers, and both ladies arranging shifts around their own working schedules, then thank you is not enough!

Egg-laying and brooding were evident between the last week of April and the 2nd week of May. It became evident that, in spite of diligent care, our four eggs were not going to hatch. The Canadian Peregrine Foundation was able to purchase three chicks from breeders in Ontario and Quebec. With much fanfare, these chicks – a female and 2 males – were banded, taken up to the nest ledge of the Crowne Plaza Hotel and placed on the nest in exchange for the eggs. Then we all waited with bated breath, watching the chicks and the adults on the monitors. In minutes the adoption process seemed successful. We knew it was finalized when "dinner" was delivered!

June 29th saw a packed room at the "Falcon Suite" for a training session. Daryl Seip (MNR) went over the protocol, with the assistance of Dr. Paul Gully, for handling a downed chick. Eve Ticknor (Peregrine Watch Coordinator) went over pertinent information regarding the logistics and expectations of the volunteers, and all three were on hand to answer questions. At times Daryl seemed to take second place to the activities on the monitor!

We started our watch at 6 a.m. on July 4th, unable to gain access to our post on the roof! Other than a few minor glitches, we covered all the daylight hours for nearly the entire month of July. Streamers were installed on the building at 240 Sparks by staff of the MNR in advance of the fledging period. The "Falcon Suite," managed by Robyn Carlson for CPF, and the presence of our volunteers on the sidewalks attracted many people, including new volunteers for us!

Being a volunteer was exciting, and occasionally risky, as Bernie found out while doing "roof" duty. Diligent parents weren't keen on his presence there, and he was very glad to have borrowed a lawn chair! Volunteers watched for a few to many hours. We met wonderful people, and already have a list going for next year! The many observations from our volunteers, and from others working nearby, are invaluable.

Loft, our first chicklet to “fly” left the nest ledge on July 12th, followed later that evening by his brother, Preston. Their sister, Jessie, prudently waited a few days until she was ready. Unlike her brothers, she never did need rescuing.

In the summary of the 1998 Watch, Bev stated, “If we’re lucky, we will be able to apply what we’ve learned next summer when, who knows, there would be three or more fledglings to follow!” How much more right could she be? Jessie, Loft and Preston are all flying well and learning new skills from their parents.



Peregrine Falcon, drawing by Chris Lewis.

Many thanks to:

- * The staff of Constitution Square who made things as easy as possible for us, especially by giving us access to their roof.
- * The staff of the Crowne Plaza Hotel who assisted us in returning chicklets to their nest ledge.
- * The staff of the Radisson Hotel who let Eve access a room to check on Loft, and made sure no one else would disturb him.
- * The staff at 240 Sparks who let us on the roof to put up streamers.
- * The staff at the Wild Bird Care Centre for looking after Loft after his accident, and for being ready for just such an incident.
- * Robyn Carlson who dropped everything to rescue Loft at the time of his accident; who helped us monitor the chicklets progress and who helped keep track of our volunteer schedule.
- * Mark Nash, of the Canadian Peregrine Foundation, who let us share their "Falcon Suite," and who found our chicklets for us.
- * Sandy Garland, OFNC webmaster, who faithfully put our observations on our web page, relayed new volunteer information and questions to Eve (especially from a British Travel Writer, Nick Roe, who will be writing us up for the Telegraph of London).
- * Dr Paul Gully who participated in our training session and later assisted at the banding of our three chicklets.

All volunteers receive a star because they are all equally important to this venture regardless of the amount of time that was given. Two stars are for those who gave over 20 hours and three for those who gave over 40 hours!

- | | | |
|--------------------------|---------------------------------|-------------------------|
| * Allison, Ken | * Kelly, Chris | ** O'Neil, Jim |
| * Allison, Tim | ** Kelly, Greg | * Palmer, Karen |
| * Anderson, Jennifer | * Krywicki, Kathy | ** Peterkin, Bev |
| * Arseneault, Mary Ellen | ** Ladouceur, Bernie | * Poisson, Andre |
| * Birkett, Pam | ** Lafleur, Bob | *** Pope, Frank |
| *** Bishop, Roseanne | ** Lane, Don | * Pruden, Nick |
| * Bonneville, Paule | * Lavioe, Nancy | * Rawlings, Beryl |
| * Bowen, Colin | * Lavoie, Tony | * Rimmer, Chris |
| ** Bowker, Art | * Lewis, Chris | * Roach, Bob |
| * Burgess, David | * Lonergan, Michelle | * Roach, Hayley |
| * Burgess, Margaret | ** Maitland, Phil | * Sander-Regier, Renata |
| * Carriere, Stephanie | * Maybec, Bonnie | * Schnupp, Randy |
| * Chalk, Ray | * Maybee, Dick | * Selby, Colin |
| * Daniels, Doug | * McBride, Bev | * Simard, Michel |
| * Drysdale, Brent | * McGugan, Jean | * Sirois, Langis |
| ** Farkas, Stephen | *** McKenna Rochon, Nathalieigh | ** Smythe, Dave |
| * German, Allan | * McLean, Gordon | ** Sullivan, John |
| * German, Carol | * McLean, Maxine | * Sylvester, Mary |
| * Haas, Claire | ** Meads, Bonnie | *** Ticknor, Eve |
| * Hawkins, Jill | * Molano, Juan | * Ticknor, Richard |
| ** Higgins, Terry | * Moore, Dave | ** Tryphonas, Daphne |
| ** Hoffe, Ron | ** Moreau, Gib | * von Schoenberg, Paul |
| ** Jeffrey, Ian | * Murphy, Mike | * Wright, Bruce |

The Much Maligned Starling

Jack Holliday

The lingering Autumn of 1998 highlights the unusual weather we had in 1998. As I write, December 12th, 1998, a weak sun slants in the window bathing me with a tepid warmth. Outside the earth is snow-free, the grass is green. In the gardens the flowering cabbage and kale continue to provide bright colours, although on long, leaning stalks now. The temperature is a balmy 6°C. That is, plus 6, and not the usual minus 6 expected for this, almost mid-December day.

Each day they come, the starlings in a great flock of perhaps five-hundred. At first, they perch high in the tops of two or three tall oaks. Then, after a very careful observation of the air and ground to ensure their nemesis, the Sharp-shinned, is not watching, they descend in a steep glide, at first in ones or twos, then in increasing numbers, to a chosen area of open lawn or garden. They stay in close proximity to each other, seldom more than a half-metre apart, the whole group moving slowly in the same direction.

We've watched the solitary robin forage: a quick run of a metre or two, the cocking of the head to one side to examine something of interest, another run at a tangent to the first, a quick stab at seemingly nothing, another tangential run, a stop, five rapid short steps, the beak lowered and pointing down, a pause, a quick stab, a seize, a backward tilting tug-of-war, a pause, a re-grip on the now-obvious worm, another pause and another pull. The worm weakens. Two or three more tugs and a final backward four steps by the robin. Then as the unfortunate worm writhes on the ground, the Robin takes a brief rest before dispatching the worm by swallowing it whole. Then a repeat of the whole performance.

Not so the starling. Almost never alone, even in breeding season when foraging for food for nestlings, the starlings work in small groups. After the young have been raised, the family groups form large flocks, often numbering thousands. The starlings are the avian "gleaners." As they move individually among the flock, they search the ground. Not a leaf remains unturned, not a cranny remains unprobed. First left, then right, often in a circle each bird goes. Nothing is missed, woodlice, beetles, millipedes, centipedes, ants (dead or alive). All is consumed. Too rapid for my eyes, they waddle, like mechanical toys, picking up and gulping down all sorts of unidentifiable bits. Where a robin, with its selective taste can find nothing to eat, the starlings find a smorgasbord.

I've seen a starling seize a gray slug which immediately exuded copious slime, its only protection. The starling carried the slug to an area of dry grass, and holding the slug firmly with its beak, wiped it rapidly back and forth on the grass. When "clean," it was eaten. Then the starling ran back to search for another. Our own Elaine has seen starlings carry tent caterpillar cocoons to a rooftop, catch the silk strands of the cocoon on the rough grit of shingles, then with the cocoon held firm, open it and devour the pupa inside.

Starlings are "with us." Not for them the solitudes of the forests. No, it is on our lawns and parkways (where the grass is short), and the parking lots and roadways where they earn their living. Dropped crumbs, lost potato chips, squashed insects, all are eagerly consumed. They dodge our cars and happily forage along our median strips.

As well, they provide a continuous source of food for the Accipiters and Falcons. When the whole flock, as one, starts from the ground and heads for the nearest tree, you can be sure that they've lost some recent members to a hawk, most probably a Sharp-shinned or Cooper's Hawk. Perhaps, although we can't see it, one of the starlings has detected a predator perched in a tree or flying nearby.

Soon the large flocks will depart, flying just as far south as necessary to find food. A few small hardy flocks will stay with us through Christmas, the New Year and the snow and ice storms of January and February. The very hardy ones only. They'll depend on what they can find. Around my place, they visit feeders and soon discover who puts out table scraps for them. They find where the Mountain Ash berries and small crabapples hang. As a last resort there is always the buckthorn berries. These berries act as a laxative on humans, so perhaps the birds can't eat them either as a steady diet. One can tell when they have consumed Buckthorn; their droppings become blue blobs in the snow.

The more one observes starlings, the more appreciative one becomes. They are much like us, living in the cities, scrambling to raise a family, enjoying the summers, surviving the winter. Some even travel south to avoid the cold, but discover that competition is more fierce there because of the millions of local birds to which are added all those from farther north. So, we don't scrape our plates into the garbage but place our food scraps out in a cleared patch on the snow. Then we watch the antics of the half-starved birds as they come to get enough to carry them through another winter's night. They are semi-dependent upon us, so don't cuss them at your feeder; learn to appreciate these active birds as they struggle to survive. ❧

More Red-eared Sliders in the Ottawa District

Stephen Darbyshire



Adult female red-eared slider turtle, photographed at Strathcona Park in Ottawa on August 22, 1999. The "red-ear" is visible in this photo as a grey patch on the side of the head behind the eye. Below the eye is a thin yellow stripe (appearing whitish here), which extends downward to the throat. Photo by S. Darbyshire.

Two reports of red-eared sliders (*Trachemys scripta* subspecies *elegans*) in the Ottawa area have been made in *Trail & Landscape* over the last few years (Darbyshire 1997, Seburn 1996). I reported one caught at the Petrie Islands of the Ottawa River in 1997 and Dave Seburn reported one found just south of Manotick, near the Rideau River in 1996. This turtle is not native to the Ottawa area (or Canada), but young turtles were extensively sold in the pet trade from 1950-1970. They are sometimes still seen for sale, although many regions, including the City of Ottawa, banned their sale years ago.

August 22, 1999, was a bright sunny day in Ottawa. At about 11 a.m., while walking along the Rideau River shore at Strathcona Park in downtown Ottawa (near Laurier Ave. East), I saw a large turtle basking on a rock in the shallow water amongst the emergent vegetation. Closer examination with binoculars revealed it to be a red-eared slider. When the animal was caught it turned out to be a large adult female. The carapace measured 19.1 cm in length and it seemed quite healthy. It was impossible to take the captured turtle with me, so it had to be released back into the river whence it came.

On September 12, at about noon, another red-eared slider was seen sunning on the rocks near shore at Strathcona Park. Unfortunately this turtle could not be captured for close examination, but it was a smaller animal than the one seen the previous month. From what could be seen of this second turtle from a distance (longer claws on the front feet compared to those on the hind feet) suggested that it was probably a male turtle.

Red-eared sliders can easily be distinguished from our common painted turtles, and indeed from all other North American turtles, by the large red patches (or broad stripes) on the side of the head behind the eyes (see illustration). Painted turtles have a yellow blotch or stripe in a similar position. Both turtles have other finer yellow lines and markings on the side of the head and neck. Red-eared sliders lack any of the red colouring on the edge of the upper shell (carapace) that painted turtles have. On the underside of the shell (plastron) painted turtles are a yellowy colour and usually have an elongated central blotch of a somewhat darker shade. Red-eared sliders have a number of darker blotches around the outside of the shell which contrast sharply against the yellowish background colour.

It is quite unfortunate that these turtles are turning up in various spots around the Ottawa area. With more and more sightings it seems likely that these are over-wintering turtles that have been introduced over the years by people releasing unwanted pets. As yet there are no signs that red-eared sliders are reproducing in our area. It is to be hoped that our summers are too short and our winters too long for this southern turtle to successfully reproduce and maintain viable populations in the Ottawa District. Even without any reproduction or re-introduction we may see red-eared sliders in our rivers for many years to come because of their long life spans (Darbyshire 1997).

Literature Cited

- Darbyshire, S. 1997. A Red-eared Slider in the Ottawa River. *Trail & Landscape* 31: 157-160.
- Seburn, D. 1996. Turtle Trouble. *Trail & Landscape* 30: 149-151 ▣

A Key to Adult Damselflies of the Ottawa District

John Sankey

This key is reduced from published keys that include many more species than occur in the Ottawa District, and primarily from "The Odonata of Canada and Alaska" by E. M. Walker. I also consulted in detail "A Manual of the Dragonflies of North America" by J. G. Needham & M. J. Westfall, "Les libellules du Québec" by A. Robert, and "Manuel d'identification des Libellules du Québec" by R. Hutchinson & A. Larochelle. I favoured structures that are visible on a living insect. Each term mentioned in the key was verified against all applicable specimens from Ontario & Quebec (excluding the far north) in the Canadian National Collection of Insects.

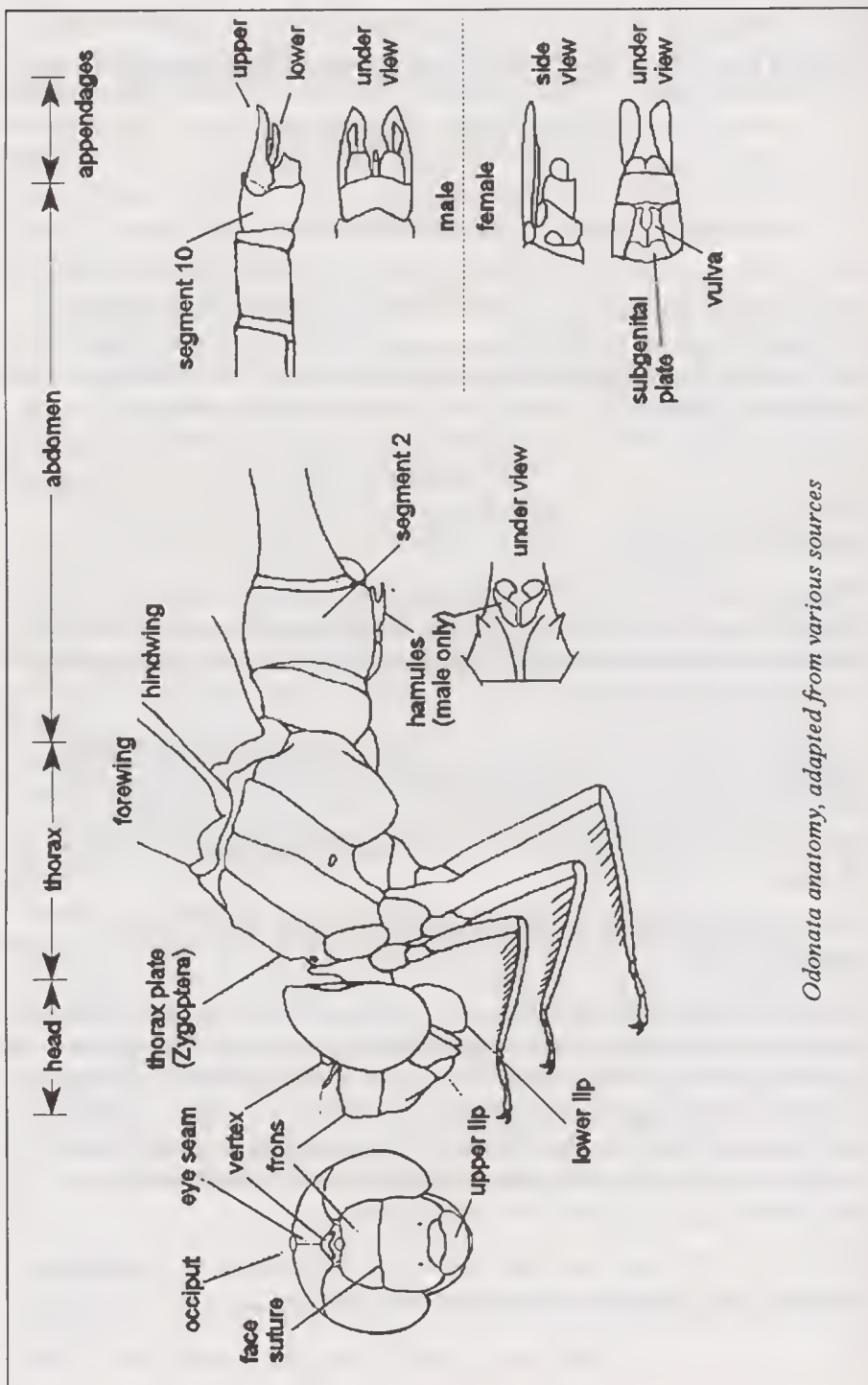
The next version of this guide will be based primarily on key marks, as all bird guides now are, rather than on a key. The colours of living insects will be especially useful in this regard – these are not used by experts since dragonflies lose their colour when dead.

I include in this key all species noted by Walker as having occurred within a county that entirely or partially falls within the District, as well as species observed by Raymond Hutchinson within the District, and an additional species whose distribution makes it probable that it occurs here – a total of 32. Subspecies are omitted.

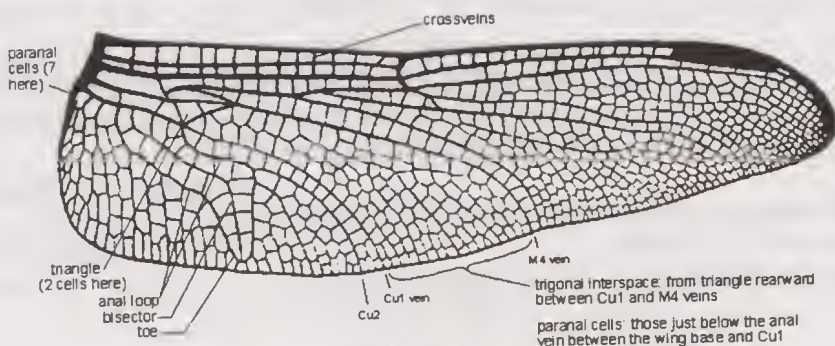
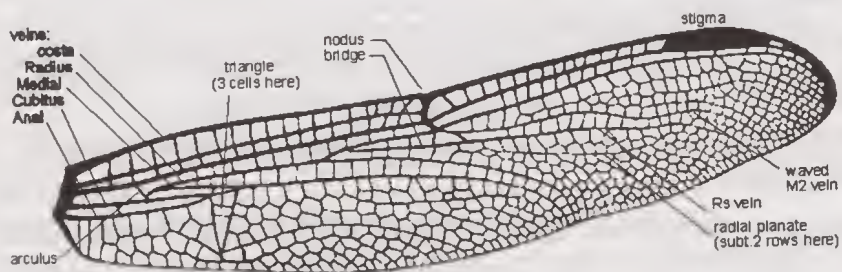
I use the names found in "A Synonymic List of the New World Odonata" (Garrison, 1991).

Rather than force this key into strict dichotomous form, I have presented it in the way that shows the actual choice structure most clearly. Within each numbered section, key descriptions are to be examined in order. It is assumed that species satisfying prior descriptions are no longer being considered. The terms preceding the semicolon are the key proper, and should all apply to a specimen from this area; terms following the semicolon are additional information included to help confirm the choice.

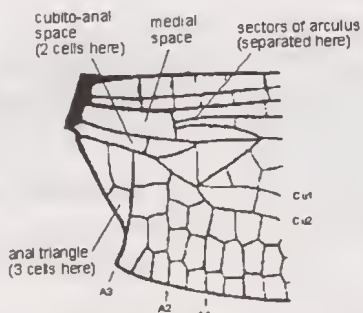
Dates include the earliest and latest documented sightings, prior to 1998, that I have found for flying adults of each species in Ontario.



Odonata anatomy, adapted from various sources



Libelluloidea



male hindwing detail

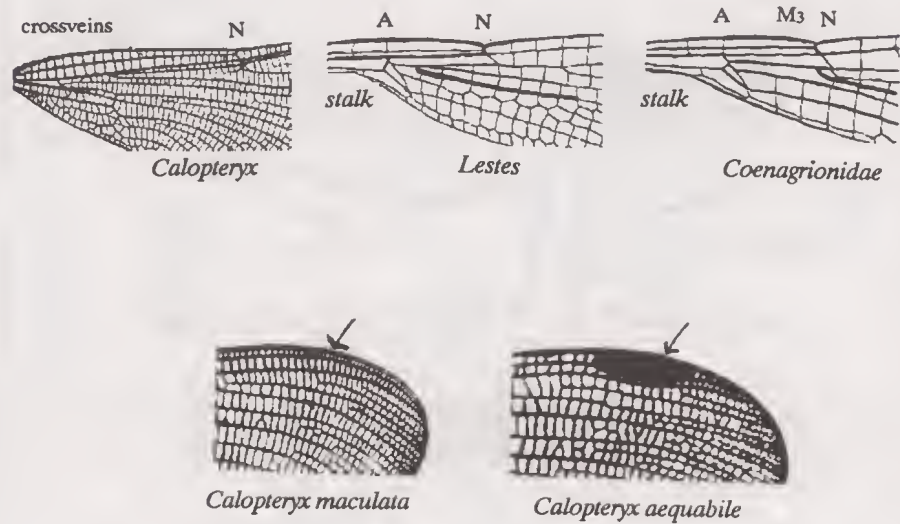
Dragonfly wings, based on photos by J. Sankey

I thank Raymond Hutchinson for extensive assistance throughout this project, and for permission to use drawings prepared for “Manuel d’identification des Libellules du Québec.” Agriculture and Agri-Food Canada gave me access to their technical libraries and the Canadian National Collection of Insects. Many colour photographs are available on the Internet – see <http://www.geocities.com/Vienna/Studio/1714/odonata.html> for mine and for links to others.

I welcome reports of corrections and additions to this list, and for any suggestions to make the field identification of these beautiful insects easier and more reliable, at (613)748-0317 or bf250@freenet.carleton.ca.

Key to Adult Damselflies

- 1a. Fore and hind wings similar; eyes separated by more than their own width (Damselflies: *Zygoptera*) 2
- 1b. Hind wing broader than forewing (to be published in a future issue of *T&L*) *Dragonflies: Anisoptera*
- 2a. Wings not stalked at base, many crossveins before nodus; wings held together above back when resting *Calopteryx* 3
- 2b. Wings stalked at base, two crossveins before nodus 4



Damselfly wings, photos by J. Sankey.

3a. Stigma divided into many cells, often unmarked; male wing all dark; female wing smoky with a striking, white stigma; 27 May-10 Sept. *Calopteryx maculata*

3b. Stigma mostly one large darkened cell with small clear cell(s) at ends; male wing clear, female wing with diffuse colour to beyond nodus and with white stigma; 3 Jun-2 Sept *C. aequabile*

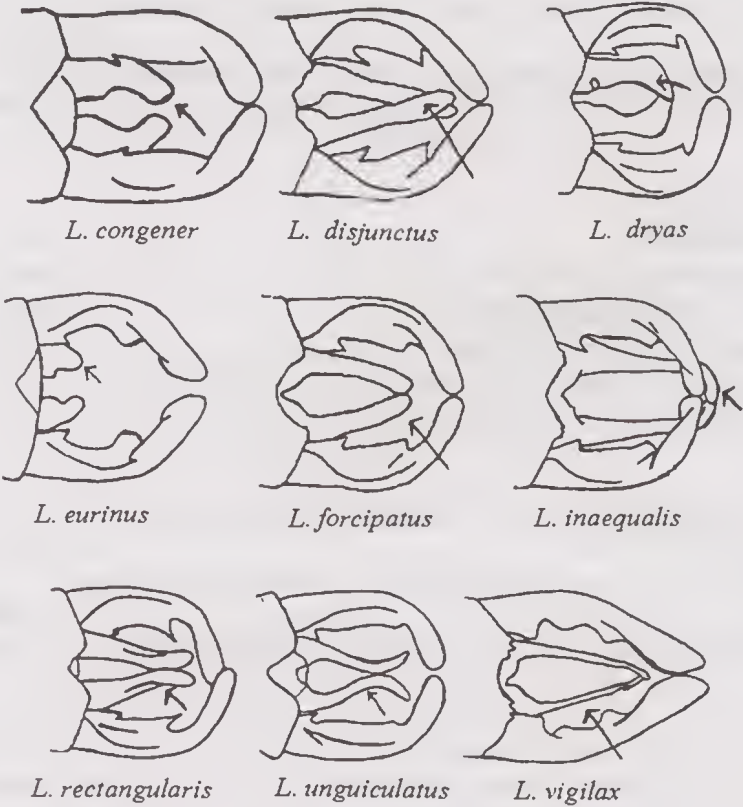
4a. Wings held spread open when resting; vein M₃ rises from M₁₊₂ closer to arculus than to nodus *Lestes* 5

4b. Wings held together above back when resting; M₃ rises behind nodus *Coenagrionidae* 10

5a. *Lestes* males (C. *Lestes* = pirate, the nymphs are especially quick-moving hunters) 6

5b. *Lestes* females (see drawings on p.18 for distinguishing sexes) 7

Lestes, male appendages, top view



Drawings from R. Hutchinson & Larochelle, with permission.

(*Lestes* males)

- 6a. Lower male appendages much less than half the length of upper; thorax dark metallic green, wings yellowish, 27 May-28 June *Lestes eurinus*
- 6b. Lower male appendages half (or a bit less) the length of upper; thorax nearly black, 9 Aug-13 Oct *L. congener*
- 6c. Lower appendages longer than upper, ends curved in; metallic green, 30 May-8 Aug *L. inaequalis*
- 6d. Lower appendages S-curved with divergent ends; blue eyes, yellow lower lip, black thorax, 8 Jun-9 Sept. *L. unguiculatus*
- 6e. Upper appendages meeting at acute angle; dark metallic green, 16 Jun-27 Aug. *L. vigilax*
- 6f. Abdomen very long and slender; hairy green lower lip, 15 Jun-10 Sept. *L. rectangularis*
- 6g. Thorax metallic green above, yellow sides; stout, 30 May-25 Aug. *L. dryas*
- 6h. Segment 2 of abdomen $\frac{3}{5}$ as long as segment 3, rear tooth of upper male appendages blunt, much smaller than front one; blackish, greenish face, 6 Jun-21 Sept. *L. forcipatus*
- 6i. Segment 2 about $\frac{1}{2}$ as long as 3, rear tooth of upper male appendages acute, as large as front one; blackish, greenish face, 2 Jul-21 Sept. *L. disjunctus*

(*Lestes* females: choices 7-9)

- 7a. Wing yellowish *L. eurinus*
- 7b. Thorax dark brown, narrow pale yellow stripe *L. congener*
- 7c. Dark areas of abdomen bronzy colour *L. disjunctus*
- 7d. Dark areas of abdomen greenish *L. unguiculatus*
- 7e. Ovipositor $\frac{1}{2}$ or less as long as abdominal segment 7 (see figure) 8
- 7f. Ovipositor as long as abdominal segment 7 (See figure) 9
- 8a. Grey humeral stripe more than $\frac{1}{2}$ as wide as dark brown stripe above; fewer than 14 postnodal crossveins *L. rectangularis*
- 8b. Reddish-brown humeral stripe $\frac{1}{3}$ or more thickness of metallic stripe above *L. vigilax*
- 8c. Humeral stripe yellowish, less than $\frac{1}{4}$ thickness of stripe above ... *L. inaequalis*
- 9a. Thorax metallic green, stripe clear yellow *L. dryas*
- 9b. Thorax dull bronze-brown, stripe pale yellow *L. forcipatus*



OFNC SO



PLACE: Unitarian Church Hall
30 Cleary Street
#2 and #18 Buses stop at Cleary Street and Richmond Road.

RESERVATIONS: To order tickets, fill in the order form and send it along with remittance before April 2nd to:

The Ottawa Field-Naturalists' Club
c/o Elaine Dickson,
2037 Honeywell Avenue
Ottawa, Ontario, K2A 0P7

IRÉE

WINE & CHEESE PARTY

Friday, April 14, 2000, 7:30 p.m.

- selection of wines ■ cheese & crackers ■ non-alcoholic punch
- tea & coffee ■ fruit

Help make this another festive evening by coming to our annual party and mingling with fellow naturalists.

Join us in honouring The Member of the Year and recipients of the Service Award, Anne Hanes Natural History Award, Conservation awards and the President's Prize.

Members are invited to exhibit photographic prints and original art on a natural history theme. The best overall colour or B. & W. Photograph will be selected by ballot and a prize awarded to the lucky winner.

Mount display items for easy handling and bring them to the Unitarian Church between 4 and 7 p.m. on Friday, April 14th. Everything is to be taken home at the end of the evening. To reserve exhibition space and for further information contact Philip Martin (729-3218).

Prizes will also be awarded for the best Macoun Field Club displays. Children (primary or high school) who are OFNC members but not Macoun Field Club members are also encouraged to compete.

NAME: _____

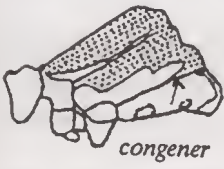
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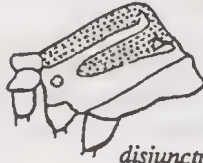
Please send me ____ tickets to the OFNC Annual Soirée at \$9 (\$4 for students under 18) per person. Enclosed please find my cheque or money order for \$ ____.



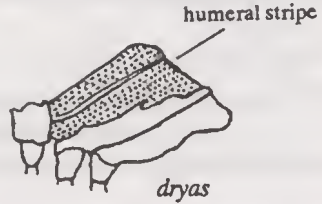
Lestes, thorax, side view



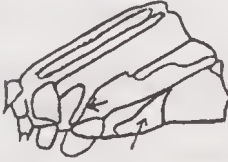
congener



disjunctus



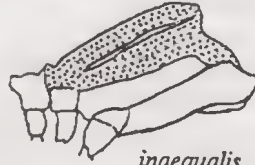
dryas



eurinus



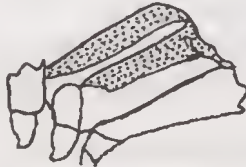
forcipatus



inaequalis



rectangularis



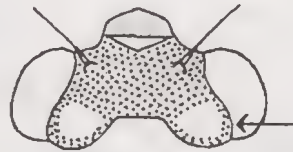
unguiculatus



vigilax



Lestes, abdomen, side view



Ischnura, head

Drawings adapted from Hutchinson & Larochelle

(Coenagrionidae: agrios = field)

10a. Leg hairs twice as long as the space between them *Argia* 11

10b. Leg hairs only a bit longer than the space between them 12

(*Argia*: Argos = bright)

11a. Upper parts of abdominal segments 3-6 black-brown; 7 Jun-12 Sept.

..... *Argia moesta*

11b. Upper parts of segments 3-6 violet-blue; 19 Jun-19 Aug *A. fumipennis*

12a. Two spots on top back of head next to eye 13

12b. No such spots 15

13a. Vein M_2 arises near the 4th crossvein after the nodus in forewing, between 2nd & 3rd vein in hindwing *Ischnura* 14

13b. M_2 arises near the 5th crossvein after the nodus in forewing, near the 4th vein in hindwing 16

(*Ischnura*: ischnos = thin, oura = tail)

14a. Two narrow long shoulder stripes; 5 May-15 Oct. *Ischnura verticalis*

14b. Two exclamation marks on shoulder; 4 June-9 Sept. *I. posita*

15a. Body only red and black; small, 1 June-8 Aug. *Amphiagrion saucium*

15b. Body blue & black with bright sulphur yellow stripe on thorax rear; 7 June-4 Aug.

..... *Chromagrion conditum*

15c. Metallic green thorax, abdomen blue with black spots all the way to segment 10; 1 June-28 Aug. *Nehalinnia irene*

15d. Similar to *N. irene* but no black spots on segments 9 or 10; 30 May-12 Aug. *N. gracilis*

thorax top view



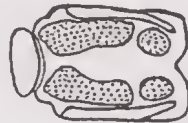
I. verticalis



I. posita



C. resolutum



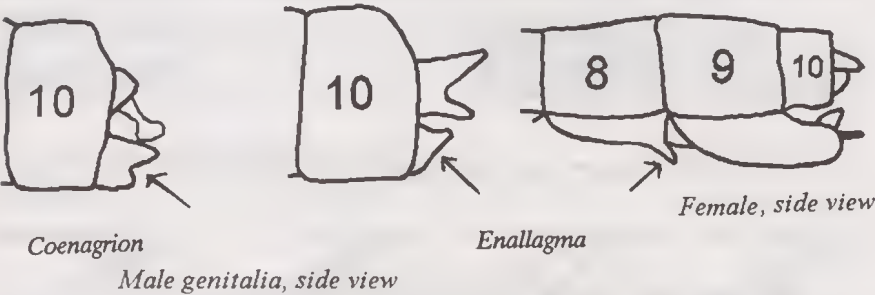
C. interrogatum

Drawings based on Hutchinson & Larochelle

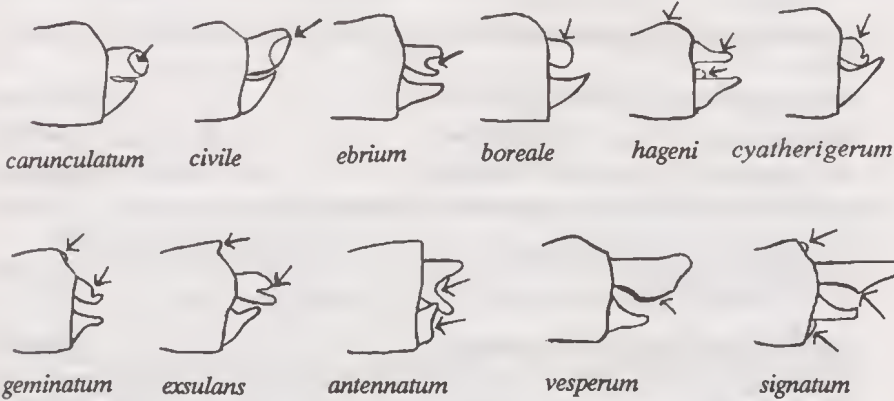
- 16a. Male: lower appendages with notch when viewed from side; female: segment 8 without spine on bottom *Coenagrion* 17
- 16b. Male: lower appendages triangular when viewed from side, female: segment 8 with spine on bottom rear *Enallagma* 18

- 17a. Two long shoulder stripes; 12 June-29 July *Coenagrion resolutum*
- 17b. Two wide exclamation marks on shoulder; (Muskoka 3 June-25 July)
 *C. interrogatum*

- 18a. *Enallagma* males 19
- 18b. *Enallagma* females 25



Enallagma, male appendages, side view



Drawings based on Hutchinson & Larochelle

- 19a. Black on segments 3 & 4 less than 2/3 length of segments; pale blue 20
 19b. Black more than 4/5 length of segments 3 & 4 22

- 20a. Upper appendages clearly split in two; 30 May-24 Aug. *Enallagma ebrium*
 20b. Upper appendages short and rounded; 16 May-24 July *E. boreale*
 20c. Upper appendages slender with points curved up; 30 May-21 Aug. ... *E. hageni*
 20d. Upper appendages with prominent tooth/ridge; 29 May-27 June *E. cyathigerum*
 20e. Upper appendages longer than lower, a pale bump on upper end 21

- 21a. Upper appendages symmetrical viewed from side; 19 June-20 Sept
 *E. carunculatum*
 21b. Upper appendages asymmetrical; 6 June-12 Sept. *E. civile*

- 22a. Upper appendages tapered to slender upturned points; 15 June-3 Sept.
 *E. geminatum*
 22b. Upper appendages split in profile 23
 22c. Different from above two choices 24

- 23a. Upper branch of upper appendages shorter than lower branch; 7 June-19 Sept.
 *E. exsulans*
 23b. Both these branches about equal; 9 June-14 Aug. *E. antennatum*

- 24a. Upper appendages' height greater than 1/2 their length; 18 June-29 Aug.
 *E. vesperum*
 24b. Otherwise; 3 June-9 Sept. *E. signatum*

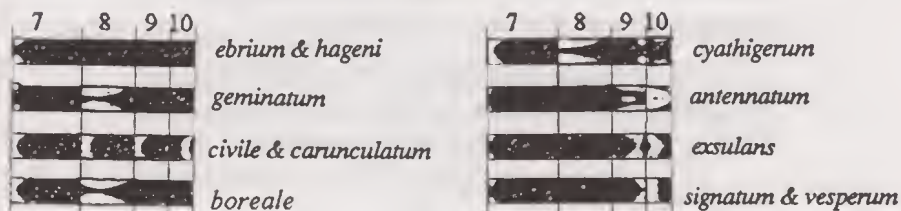
(*Enallagma* females, reliably separable only by microscopic examination of thoracic plate)

- 25a. Segment 8 with pair of large blue spots *E. geminatum*
 25b. Segments 8-10 entirely black above *E. hageni* or *E. ebrium*
 25c. Segments 7,8,9 with similar markings *E. civile* or *E. carunculatum*
 25d. Segment 8 black only on rear half or all segments pale 26
 25e. Segment 8 entirely black, segment 9 and 10 not black; eye spots elongated to,
 or almost to, occiput 27

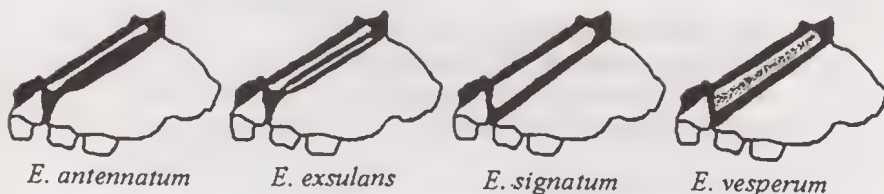
- 26a. Fine line between spots of segment 8 *E. boreale*
 26b. These spots separated by a line at front, a wider gap at rear, side spots reach top
 of segment 10 *E. cyathigerum*
 (*E. cyathigerum* is often confused with the very similar *E. vernale*, the latter has a more
 southern distribution.)

- 27a. Black humeral stripe twice or more width of pale stripe above28
 27b. Black stripe about same width or narrower 29
- 28a. Black stripe divided by pale line *E. exsulans*
 28b. Not so divided*E. antennatum*
- 29a. Pale stripe with gap in middle; M₂ begins between crossveins 4 & 5 *E. vesperum*
 29b. No such gap; M₂ begins between crossveins 5 & 6 *E. signatum*

Enallagma, abdominal segments 7-10, top view



Enallagma thorax, side view



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Present Things

Marianne Bluger Neily

There is the corpse of something
like an effigy of her
stuffed with wood-fibre propped by rods standing
on perpetual exhibit at the Nature Museum

and as though some loss might be prevented
the bird has been mounted
wired to alarms in a theft-proof glass cabinet

A passenger for once that pigeon
dazed and weak from shifting winds
folded her wings and hid
in a steam-warmed chink of a black locomotive

The engine forge-stamped with '1914'*
was the one that carved woodlands
the one that sliced prairies and ran
roping mountains and ribboning canyons with iron

the one that shrieked punctual warning
down all the sundrunk summer days
and howled baleful threats
through dark and long and lonely winter nights

the one that went leaving the immigrant
all his worldly goods cast
around him in satchels
on remote station platforms

the one that trailed echoes in empty valleys
and a signature of smoke...

The one that would skirt
the salt-sprayed coast at last
then turn and begin
unravelling the landscape again

it carried her into the country
we're headed for
the future
now
we know she flew before us

That hot-blooded bird lived by fast desire
for seeds for berries then fuelled on them ravaged
gardens and vineyards crop-fields and orchards
consuming all fruiting earth she raced
in hungry migratory twisters

Heedless she was
madness feathered
an impetuous blitz of appetite
farmers hated her species
near numerous as all other birds combined

And so in rage
for sport for feathers
for the taste of her meat
the world took aim
and shot

Sleek-necked amber-eyed
with a russet breast and mottled mantle
in fragile abundance she flourished once
on earth with us...

But only lately in our silent springs
have we come to mourn
the savage passage of a common dove
whose glory was
the love of present things

*presumed year of extinction of *Ectopistes migratorium*
- Passenger Pigeon

The Tadpole Madtom, *Noturus gyrinus*

A rarely seen fish of the Rideau River System, Ontario

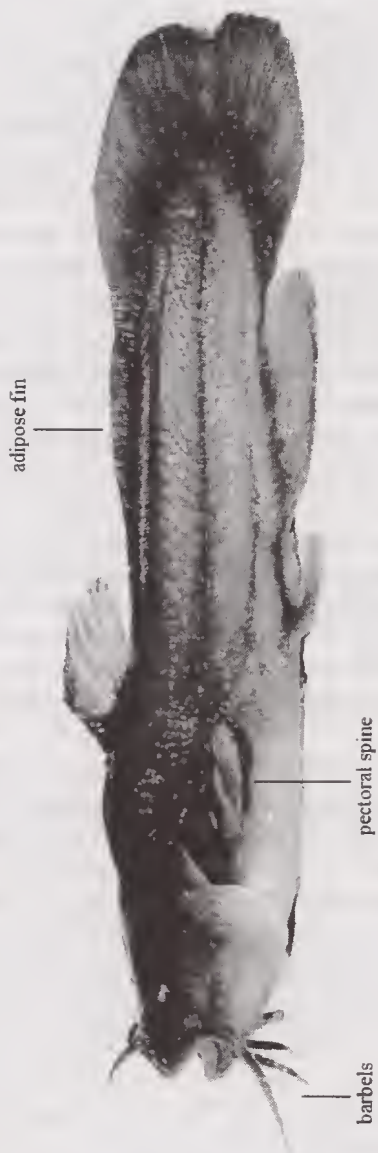
Anne Phelps, François Chapleau, and Claude B. Renaud

Tadpole Madtom, what a funny name for a fish. It is called a tadpole because its body shape resembles a larval frog. There are two explanations for the mad portion of the name. The first is that this little fish produces a poison that can cause a nasty sting and hence make the victim crazy with pain. The other explanation is that when these fish are disturbed they dart every which way in frenzy. This fish is called a tom because it belongs to the catfish family Ictaluridae, members of which have whiskers (or barbels), and tom of course is just another word for cat.

The Tadpole Madtom is the smallest member of the Ictaluridae family in Canada, rarely measuring more than 90 mm in total length. This fish is characterized by the presence of barbels, sharp pectoral spines (one spine on each side of the fish, just behind the head region), well-demarcated muscle bands along most of the body, no scales, and a long-based fleshy dorsal fin (called adipose fin) connected to the tail fin (Bernatchez and Giroux 1991, Scott and Crossman 1973). This adipose fin is not truly a fin in the same sense as the other fins on the body because fin rays do not support it.

Tadpole Madtoms are nocturnal creatures, active at night foraging along the bottom in search of small crustaceans and aquatic insects. These little fish are known among anglers because of their nasty sting. They produce a stinging poison used to immobilize potential predators such as large fish or garter-snakes. The poison is transmitted through two grooved spines (called pectoral spines). Despite their poison-injecting spines, they are used as bait to catch sport fishes (Scott and Crossman 1973). However, Tadpole Madtoms are difficult to catch with hook and line or nets due to their small size and nocturnal habits.

During the summers of 1998 and 1999, surveys of the fish community within the Rideau River and its tributaries were conducted as part of a three-year multidisciplinary study, the Rideau River Biodiversity Project, involving the Canadian Museum of Nature, the Rideau Valley Conservation Authority, and the University of Ottawa. As a result of these surveys, new information has



Side-view of Tadpole Madiom, *Noturus gyrinus*, 88 mm total length, captured in the Rideau River on 28 August 1998 (Canadian Museum of Nature catalog no. CMNFI 1999-18).

been gathered about the distribution of the Tadpole Madtom, *Noturus gyrinus*, within the Rideau system.

During the 1998 sampling season, a Tadpole Madtom was captured in the Rideau River, halfway between Burritts Rapids and Becketts Landing (45° 00' 40"N, 75° 44' 40"W) (see map). This is the first reported capture of this small catfish in the Rideau River proper. According to Canadian Museum of Nature records, its nearest known sites of capture are 10 km downstream in Kemptville Creek, a tributary of the Rideau River (43 specimens collected between 1976 and 1987; catalogue nos. NMC77-132, -134 to -136, 83-290, -316, -336, -804, -806, -816, 84-362, 85-143, 87-485). This is a significant distance for a small, sedentary fish with a limited home range. The Tadpole Madtom was caught along the edge of a cattail bed on 28 August 1998, amongst a dense cover of Wild Celery, *Vallisneria americana*, growing on a muddy substrate, situated within an agricultural area with very little tree cover. The fish measured 88 mm in total length and weighed 6 g, well below the maximum of 110 mm for the species in Canada (Scott and Crossman 1973). The gear used to catch the Tadpole Madtom was a DC backpack electrofisher. This is a battery-operated apparatus that generates an electrical field in the water. Fish are momentarily attracted to the electric current causing them to leave their hiding spots in the sediments. The people assisting the electrofisher operator then have a fraction of a second to scoop up the fish with a dipnet before they swim away. Needless to say, both the operator and the assistants wear insulated waders and gloves to protect them from the electric current.

During the 1999 sampling season, three tributaries of the Rideau River were sampled: Kemptville Creek, Stevens Creek, and the Jock River. On 19 July 1999, one young-of-the-year Tadpole Madtom (27 mm) was captured with a backpack electrofisher, in Kemptville Creek, at Currie Park in Kemptville (45° 01' 11"N, 75° 38' 30"W). Although only one Tadpole Madtom was captured, the presence of a juvenile is evidence of a reproducing population of Tadpole Madtoms in the Creek. In Stevens Creek, at North Gower, one adult Tadpole Madtom was captured with a backpack electrofisher and three adults were captured in unbaited minnow traps on 30 July 1999 (45° 07' 45"N, 75° 42' 45"W). Their total individual lengths ranged between 69-100 mm. At both the Kemptville Creek and the Stevens Creek sites, the Tadpole Madtoms were captured within shallow, mucky stretches of densely planted Wild Celery, near cattail beds. The similarities between the 1998 and 1999 sites suggest that Tadpole Madtoms prefer shallow, weedy areas with very little rock. Captured specimens have been deposited in the fish collection of the Canadian Museum of Nature (catalog nos. CMNFI 1999-18, -24 to -26).

Looking further afield, Tadpole Madtoms have been reported in the Ottawa River, the South Nation River and its tributaries, in addition to the St. Lawrence River and Lake Ontario (McAllister and Coad 1974, Mandrak and Crossman 1992). There are two other catfish species which occur in the Rideau River System and which could be confused with the Tadpole Madtom. These are the Stonecat, *Noturus flavus* and especially the young of the Brown Bullhead, *Ameiurus nebulosus*. The Stonecat is distinguished from the Tadpole Madtom by possessing a square instead of a rounded tail fin and an upper jaw projecting beyond the lower jaw instead of the jaws being equal (Bernatchez and Giroux 1991).

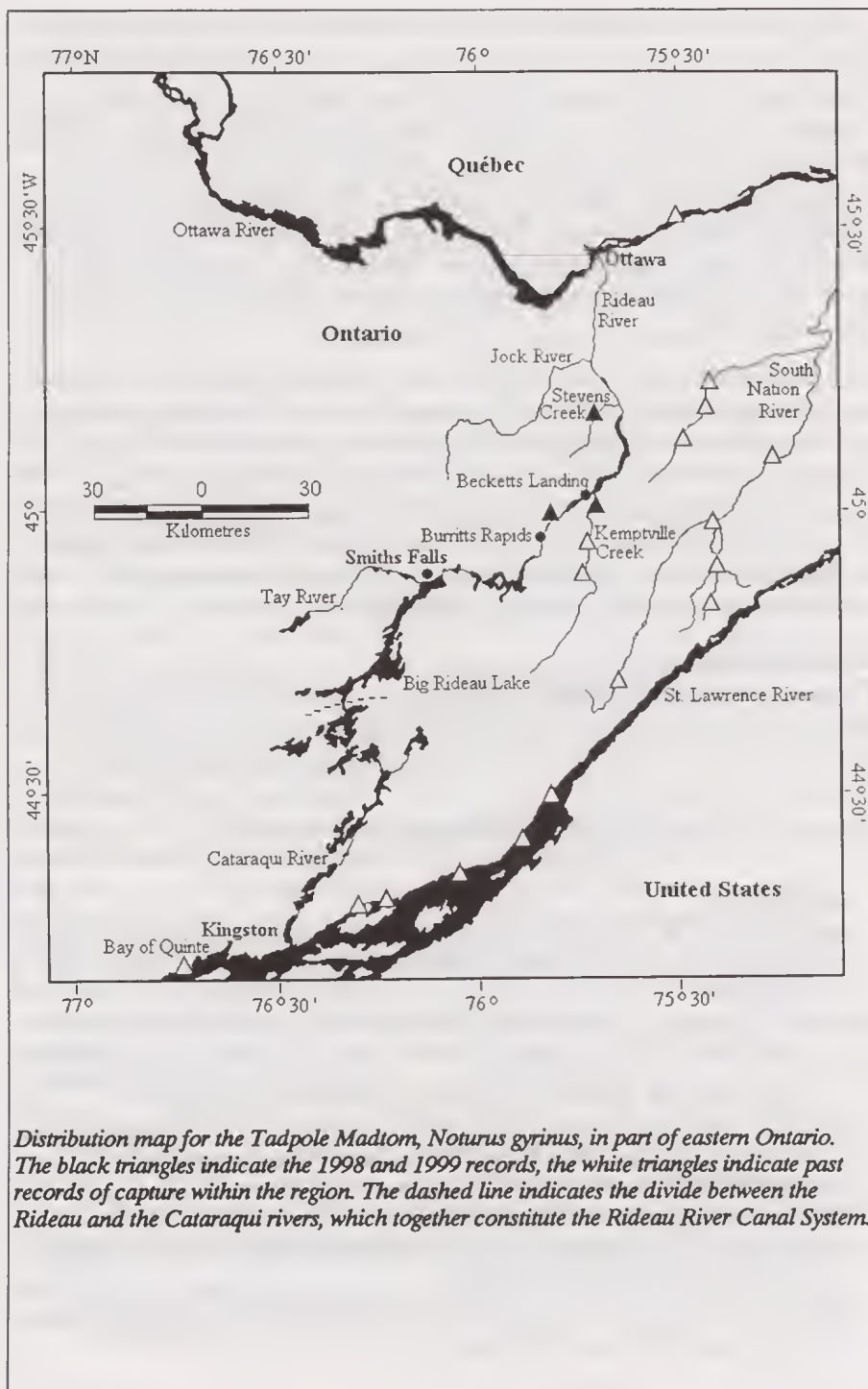
This first record of a Tadpole Madtom, considered along with the first record of a Freshwater Drum (Phelps *et al.* in press), and that of the Oscar (Renaud and Phelps 1999), recently captured within the Rideau River, increases the total number of fish species reported in the Rideau River and Canal to 58 species belonging to 20 families. Despite the fact that the Rideau River flows through the nation's capital and that fishes are a fairly well studied group of vertebrates, these new records demonstrate that there is still much to be learned about the fishes of the Rideau River and Canal System.

Acknowledgements:

Thanks to the field assistants: Noel Alfonso and Naomi de Ville, Canadian Museum of Nature and Brent Campbell, University of Ottawa. This research was financially supported by an operating grant to F.C. from the Natural Sciences and Engineering Research Council of Canada and to the Canadian Museum of Nature from the EJLB Foundation, Montreal.

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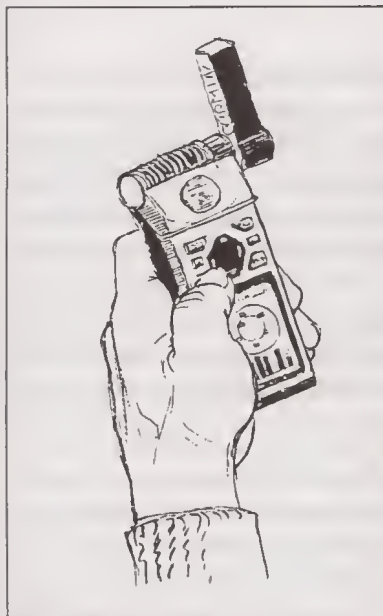
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- Authors: Anne Phelps and François Chapeau, Ottawa-Carleton Institute of Biology, Department of Biology, University of Ottawa. Claude B. Renaud, Research Division, Canadian Museum of Nature, Ottawa.



*Distribution map for the Tadpole Madtom, *Noturus gyrinus*, in part of eastern Ontario. The black triangles indicate the 1998 and 1999 records, the white triangles indicate past records of capture within the region. The dashed line indicates the divide between the Rideau and the Cataraqui rivers, which together constitute the Rideau River Canal System.*

Navigating as Naturalists with the Global Positioning System

Frederick W. Schueler



*Figure 1: Garmin 45 GPS unit.
Drawing by Aleia Karstad.*

The Global Positioning System, or 'GPS,' is a combination of satellites and computers that allows anyone to calculate their location anywhere on earth. GPS was developed by the United States Department of Defence, and is run from Colorado, with monitoring stations located around the world to track the satellites and coordinate their signals.

Twenty-four satellites, at an elevation of 20,200 km, orbit in six planes oriented at 55 degrees to the equator. Each orbital plane contains four satellites, which orbit the earth twice a day. Each satellite weighs 844 kg, is about the size of a large van, and is powered by a 7.2 m² solar panel. Individual GPS units are hand-held radio-receivers with computers which measure the time the radio signal takes to travel from the satellites to the unit

(Figure 1). This travel time, multiplied by the speed of light, gives the distance to each satellite the unit is tracking. From this, and

additional information about the satellites' orbits and velocity, the internal GPS receiver software calculates its position, once each second, by triangulation. The unit is completely passive, and transmits nothing to the satellites, though it must have a clear view of the sky in order to receive the radio signals.

In the fall of 1995 we purchased two Garmin 45 GPS units, for \$300 US each. Through years of museum collecting our standards of location accuracy had gradually increased to the point that we felt insecure if we couldn't fix our location within 100 m. Using maps, this is difficult away from roads and settlements. The GPS gives us this precision everywhere (except under heavy forest canopies), and records the time as well. Now, when we hear a frog chorus, or drive past a significant roadkill or a stand of the invasive reed, *Phragmites*, we just hit the **MARK** button to record our position as a 'waypoint.'

Each of our units stores up to 250 waypoints. GPS units feed on AA batteries (four of these power one of our units for 10 hours). A twelve-volt cigarette-lighter power cord spares the batteries while we are in the vehicle, and an external antenna on the roof amplifies the signal from the satellites. The one weakness we have found in these units is that the wires in the power and external antenna cables tend to fail where they enter the plugs. This is doubtless because we keep letting the the units fall off the dashboard, but in the future we'll give such junctions a stiff wrapping of duct tape to break the shock of falling.

If we are at a site for a while, we make one waypoint when we arrive and another when we leave, which gives us both start and finish time, and a two-point estimate of the error in the position. At home we download the waypoints into our computer database, calculate location names (e.g., 3.2 km SE Whimseyville) from a reference file of settlement or intersection points (made by GPS or from a topographic map), and the tedious data entry work of several days is reduced to a pleasant hour. Also we find that the GPS lets us find our way with a few 1:250 000 maps instead of cumbersome and expensive piles of 1:50 000 maps. Since maps cost about \$8 each, the savings from using one 1:250 000 map rather than 16 1:50 000 maps, \$120, approaches the present cost of a GPS unit.

Navigation. At the very least, the GPS changes your relationship with a topo map. You look up your position on the map, rather than mostly using the map to try to figure out where you are. The GPS was created to facilitate military navigation, and many users employ their GPS mostly for piloting boats past submerged hazards, to get to places they have been before or have found on a map, or to get back to where they set out from. Many of the features of the units exist to facilitate this. In addition to recording individual waypoints, our units can also remember and display a track of 750 points where one has been, and this could be used to record the boundaries of vegetation communities, the position of roads, or other linear features. In the past we have used the map display mostly to confirm that Hwy 43 is in the same position when we're driving back from Smiths Falls as it was when we went out, by watching our track double back on itself in the display. Recently, in roadside surveys of *Phragmites*, we were able to check that we marked each colony by watching, during the return trip, for its waypoint to slide past in the map display.

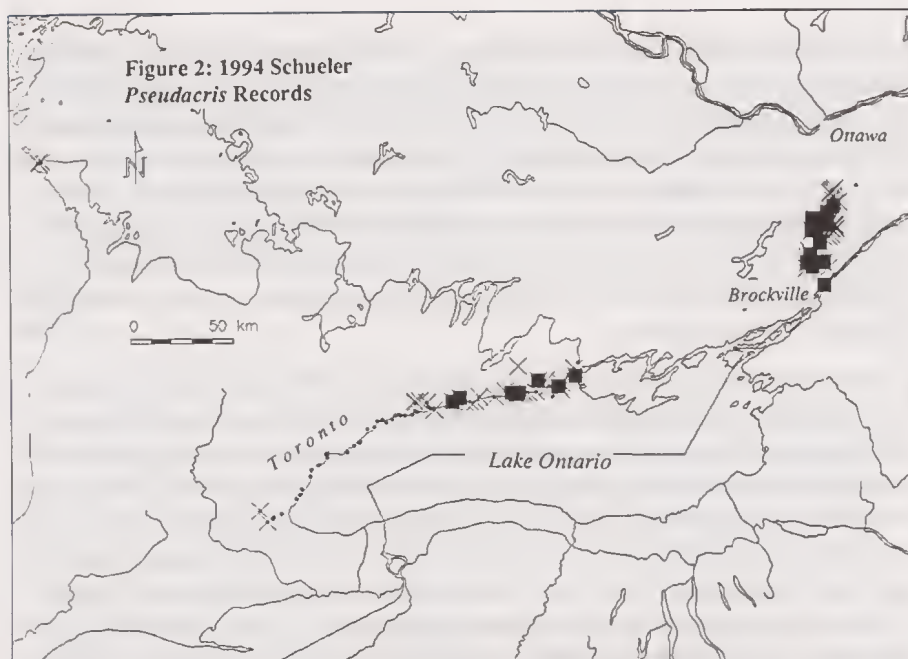
You can **GOTO** any waypoint, selected from a previous visit or entered from a map or gazetteer, and the unit displays the distance, direction, 'velocity made good' (progress towards the destination), and 'estimated time en route' (how long it will take to get there at this 'velocity made good') to the destination. We keep waypoints in our units for a score of infrequently visited acquaintances

to help us remember the way to their homes, and 'estimated time en route' provides a numerical answer to the childish "*How long 'til we're there?*" A GPS unit does not include a compass. It only knows direction as the difference between the current and previous co-ordinates. This is fine in a moving vehicle, but since errors in the position vary at slow walking speed you need some external compass (magnetic, sun, or stars) to use GOTO on foot. The unit may point the way while you are walking steadily along, but as soon as you stop, it begins to dither, and you'll have to set out briskly again, in some direction, in order to see if it is the wrong direction.

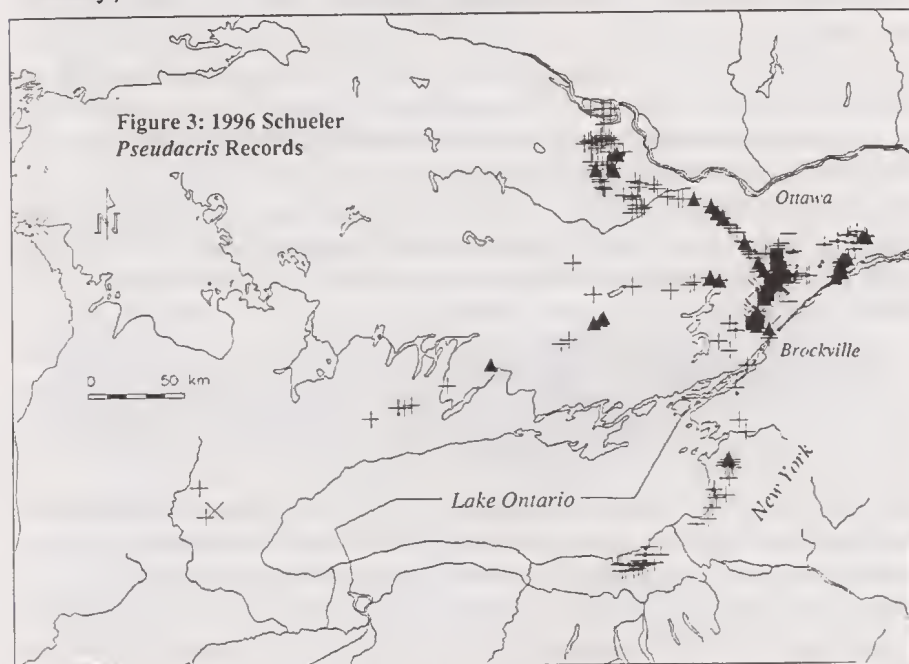
Coordinate systems. Two numerical systems are combined to translate the surface of the round earth into a flat map. A coordinate system specifies two numbers that fix a place on a two-dimensional map: *latitude* and *longitude*, or, in the UTM system, *easting* and *northing*. A *map datum* is a model of the shape of the Earth, and specifies where the surface of the ground intersects the co-ordinate system. Map datums (the correct plural) used to be calculated by surveyors' triangulation, but since 1960, satellites have provided much longer geodetic baselines, and have made possible global map datums. GPS units can display a wide range of geographic coordinate systems such as lat/long, UTM, and various national grids that are not used in North America, as well as many old map datums so that GPS coordinates can match those on maps.

Long before we had a GPS, we heard of a US Navy ship with an early satellite navigation system, which gave museum collectors in Tierra del Fuego coordinates which didn't match any map they had, presumably because of errors both in the maps and in the map datums on which they were based. To match Canadian topo maps published before 1992 you have to set your GPS to the NAD 1927 (Canada) datum, but new topo maps are based on NAD 1983, which is effectively the same as the WGS 1984, which is the default on GPS units. You would get a 200 m North/South error (in central Canada) if you used WGS 1984 setting for NAD 1927 topo maps. This is why the Military Grid square designations on the maps were changed to the new map datums.

Accuracy. The unit displays an internal estimate of 'error,' which ranges from 15 m (rare) to 21-30 m (standard) to 200 m (unit is losing contact with the sky). Accuracy is reduced, or a fix may be impossible, when satellites are in view but happen to be lined up in a narrow band, so that the unit can't get a wide triangulation to fix its position. Our units track eight satellites, and at the time we bought them they were a big advance on the first civilian units which only followed five (and cost \$1400). Newer units track twelve satellites, and do much better than ours when they can only see a little of the sky, as on mountain slopes or in forests. The 'dithering' that the US military introduces into the



Before Global Positioning: 1994. 'x' Spring Peeper, P. crucifer, ■' Chorus Frog, P. triseriata. Dots are records of Toads, Bufo americanus, as a control for places where neither Pseudacris species was found. (All records archived in the Ontario Herpetofaunal Summary.)



Using GPS: 1996. Symbols for records georeferenced by maps are the same as in Figure 2; GPS records indicated by '+' for Spring Peepers, and '▲' for Chorus Frogs.

signal (to prevent Iranian terrorists from dropping GPS-guided missiles into the Oval Office) produces a nominal 100 m 'error' in positions, and between this and real errors, your position, when stationary, seems to drift at about walking speed (0-6 km/hr). At times the entire system shuts down for a few to several minutes. I have heard that at least some of these shutdowns occur during events the US military considers vulnerable to terrorism, but this does mean that you can not rely on the GPS as your only georeferencing technique.

I use our driveway as my bench mark for the accuracy of our system, by recording our position when we leave or arrive home. We park between the house and a big Red Maple, so the view of the sky is somewhat restricted. The actual standard deviation of the position of the truck is probably about 1-2 m, and the range not as much as 10 m. We made 148 arrival and departure waypoints here from 1996-1998, and the mean deviation from the average position is 36.5 m. In 75 departures, when the unit had just been turned on, the average deviation was 43 m. On arrival, when the unit was running as we were driving, the average deviation is 30 m. There does not seem to be any difference between summer (May-October, Red Maple in leaf) and winter (not in leaf) readings, though this attempt to assess effect of the unit's view of the sky is complicated by the unrecorded changes in proximity of an aluminum trailer. There are no consistent year-to-year changes in the deviations. Departures were less variable in 1996, whereas arrivals were more variable in 1997.

Ten percent of the readings are within 10 m of the average position (the positions are recorded in my database with a precision of 10 m), 55% within 30 m, and 85% within 60 m. Seven records, 5% (6 departures, 1 arrival), are more than 100 m from the mean position. The greatest deviation was 164 m, for a departure on 18 August 1996. I don't record the unit's estimate of error in these records, but many departure records are made with indications of error that would be unacceptable for a normal waypoint, and to this extent departure records overestimate the errors that would be present in 'normal' waypoints in the field.

Newer units have a feature advertised as 'position averaging,' which would allow you to record an average position when you are stationary. To emulate this, and see how sequentially recorded readings compared with the arrival/departure records taken over three years, I set the track function to record a position every 20 seconds in our driveway, from 1712-2133hr, 16 February 1999 (sky overcast, no precipitation). This produced 767 records, with a mean position 4 m from the mean of the 148 arrival/departures, and a 16 m standard deviation in easting and a 25 m standard deviation in northing. This is very similar to the variance of the arrival records, and I conclude that, for our units,

accuracy of coordinates, with a good view of the sky, is comparable to, or a little better than, what you could extract from an accurate 1:50,000 topo map.

Computers. To use GPS data in your computer you may have to reformat the data for the application you will use them in. This may take some programming, though there are, doubtless now, cartographic programs that import the files automatically. Using the 1995 Garmin DOS software, we can view the relative position of points and tracks, but this program is very memory-hungry, and while the literature that comes with it mentions base maps, I haven't inquired how to get them, because I do all my mapping in Axys Software's QUIKMAP. The data are stored in an ascii file with a relatively simple format. Since 1995 we have added 2692 GPS waypoints to our Foxpro natural history database.

One of the things we are interested in is the Ontario and New York distribution of two small spring-calling Treefrogs, Spring Peepers, *Pseudacris crucifer*, and Chorus Frogs, *P. triseriata*. Figures 2 and 3 contrast the records we made of these species in the last year before we used GPS (1994) and the first year when we were using GPS effectively (1996). In 1994 we were well funded to survey calling frogs, but the 485 records are limited to areas where we had established listening stations, or were using 1:50,000 topographic maps. In 1996 we surveyed these species, incidently to other activities, and the 469 records are both more widely dispersed, and cost a great deal less effort than the 1994 records.

Every household should have at least two GPS units! We each use ours to solve our different geographic problems, we can lend one to travelling friends and not be handicapped, and with a GPS anyone can record exactly where they have seen something, or picked up a specimen. Other households will use the GPS in different ways. This account is based on the things we do with ours. But however you use it, this is the first electronic high-tech device that encourages a sense of place in the user instead of propagating a placeless global culture.

Coming Events

arranged by the Excursions & Lectures Committee.

For further information,
call the Club number (722-3050) after 10 a.m.

Times stated for excursions are departure times. Please arrive earlier; leaders start promptly. If you need a ride, don't hesitate to ask the leader. Restricted trips will be open to non-members only after the indicated deadlines.

ALL OUTINGS: *Please bring a lunch on full-day trips and dress according to the weather forecast and the activity. Binoculars and/or spotting scopes are essential on all birding trips. Unless otherwise stated, transportation will be by car pool.*

REGISTERED BUS TRIPS: *Make your reservation for Club bus excursions by sending a cheque or money order (payable to The Ottawa Field-Naturalists' Club) to E.M. Dickson, 2037 Honeywell Avenue, Ottawa, Ontario K2A 0P7, at least ten days in advance. Include your name, address, telephone number and the name of the outing. Your cooperation is appreciated by the Committee so that we do not have to wait to the last moment to decide whether a trip should be cancelled due to low registration. We also wish to discourage the actual payment of bus fees on the day of the event.*

EVENTS AT THE CANADIAN MUSEUM OF NATURE: *The Club is grateful to the Museum for their cooperation and thanks the Museum for the use of these excellent facilities. Club members must be prepared to show their membership cards to gain access for Club functions after regular museum hours.*

BIRD STATUS LINE: *Phone 860-9000 to learn of recent sightings or birding potential in the Ottawa area. To report recent sightings call Michael Tate at 825-1231. This service is run on behalf of the Birds Committee and is available to members and non-members.*

Le Club des Ornithologues de l'Outaouais has a similar service, in French, run by Daniel St-Hilaire at 778-3413 and the Bird Status Line is 778-0737.

Tuesday	OFNC 121st ANNUAL BUSINESS MEETING
11 January	Meet: Auditorium, Canadian Museum of Nature, Metcalfe and McLeod Streets.
8:00 p.m.	The Council for the year 2000 will be elected at this meeting and a brief review of the activities during 1999 will be given, as well as a statement of the Club's finances. There will also be an interesting presentation by the Membership Committee.

Tuesday
8 February
8:00 p.m.

OFNC MONTHLY MEETING
WESTERN WILDLIFE

Speaker: Roy John

Meet: Auditorium, Canadian Museum of Nature, Metcalfe and McLeod Streets.

Take a trip through Canada's West looking for wildlife that has adapted to dry summers and cold winters. Come and see magnificent cranes, colourful prickly pears and the graceful pronghorn.

Sunday
27 February
10:00 a.m.

CROSS-COUNTRY SKI TRIP TO
THE MARLBOROUGH FOREST

Leader: Don Cuddy

The Marlborough Forest is the largest agglomeration of public land in the Ottawa-Carleton area outside the Greenbelt. The trails through these several hundred acres are used for birding and hiking. The area is a mixture of pine plantation and natural lowland forest. Participants should be prepared to ski 5 to 10 km over mostly flat terrain with various stops to observe signs of nature in winter. The outing will last about four hours with a break for lunch. Pack a lunch and hot beverage. The trip is limited to the first 20 to **REGISTER WITH THE CLUB NUMBER (722-3050)** by February 20th. The meeting place and pertinent details will be given to registrants at that time.

Sunday
5 March
8:00 a.m.

WINTER RAPTORS OF THE OTTAWA AREA

Leader: Bernie Ladouceur

Meet: Lincoln Heights Galleria, northeast corner of the parking lot, Richmond Road at Assaly Road.

This generous half-day outing will be in quest of various species of hawks and owls that may be frequenting certain fields and woodlots in the Ottawa area. Warm clothing, a snack and a hot drink are strongly recommended.

Tuesday
14 March
8:00 p.m.

OFNC MONTHLY MEETING
ENDANGERED SPECIES LEGISLATION

Speaker: Marc Johnson

Meet: Auditorium, Canadian Museum of Nature, Metcalfe and McLeod Streets.

Marc Johnson has been an environmental consultant for eight years with industry and government, and more recently with the Canadian Nature Federation, working to promote the conservation of endangered species and to ensure their effective protection across the country. He will give an overview of the mass extinction crisis that we are currently facing, in particular the biodiversity loss in Canada, and the progress our federal and provincial governments are making towards the protection of species at risk. In particular, he will discuss the federal legislation which is to be introduced in Parliament this spring.

Date and
time
to be
decided.

AMPHIBIANS IN SPRING

Leader: Stephen Darbyshire

The success of this outing is highly dependent on favourable weather conditions. Those registering with the Club number (722-3050) prior to March 20 will be notified of the precise particulars when a decision is reached to proceed with the trip. Rubber boots, a strong flashlight and a dipnet (if possible) are recommended. Children will be welcome.

Saturday
25 March
9:00 a.m.

NUDE SHOW

Leader: Albert Dugal

Meet: Lincoln Heights Galleria, northeast corner of the parking lot, Richmond Road at Assaly Road.

Come out and learn to identify our naked trees and bushes in winter. We shall go to the Britannia Filtration Plant (entrance gate on Cassels). This is an excellent opportunity to explore a local conservation area. The outing is limited to the first 15 members to REGISTER WITH THE CLUB NUMBER (722-3050) by March 20.

Sunday
26 March
2:00 a.m.
to
8:00 a.m.

EARLY MORNING OWLING

Leaders: Tony Beck and Bernie Ladouceur

Meet: Tim Horton Donuts, south side of Robertson Road (i.e., Old Hwy. 7) between the Richmond Road turnoff and Moodie Drive in Bell's Corners.

Experience the thrill of the chase as our two intrepid leaders once again seek to locate and identify the diagnostic calls of several nocturnal species of owls. The outing is limited to the first 20 individuals to **REGISTER WITH THE CLUB NUMBER (722-3050)** by March 19th.

Sunday
2 April
6:30 a.m.
to
6:30 p.m.



BUS EXCURSION: SPRING BIRDING AT PRESQU'ILE

Leaders: Roy John and Colin Gaskell

Meet: Lincoln Heights Galleria, northeast corner of the parking lot, Richmond Road at Assaly Road.

Cost: \$30.00 (**PLEASE REGISTER EARLY**; see the introduction to Coming Events for information)

The Club's traditional spring outing to Presqu'ile Provincial Park offers an ideal opportunity to study the diverse assortment of waterfowl that congregate in the surrounding waters during their northward migration. Transportation will be by a comfortable motorcoach equipped with washroom. **Be sure to set your clock forward one hour Saturday evening.**

Tuesday
11 April
8:00 p.m.

OFNC MONTHLY MEETING SPRING

Speaker: Isabelle Nicol

Meet: Auditorium, Canadian Museum of Nature, Metcalfe and McLeod Streets.

Shake off your winter blues and come and let Isabelle's slides give you a preliminary taste of coming events of spring in Ottawa. Isabelle Nicol is an accomplished photographer and naturalist. She speaks to many groups in and around the Ottawa area – from schools to seniors, from naturalists to horticultural groups – on nature and wildlife.

Friday
14 April
7:30 p.m.

OFNC SOIRÉE WINE AND CHEESE PARTY AND ANNUAL AWARDS CEREMONY

Meet: Unitarian Church Hall, 30 Cleary Avenue.
See the Centrefold for further details.

Sunday
23 April
6:30 a.m.
to
6:30 p.m.



BUS EXCURSION: HAWKS ALOFT AT DERBY HILL

Leaders: Bernie Ladouceur and Roy John

Meet: Lincoln Heights Galleria, northeast corner of the parking lot, Richmond Road at Assaly Road.

Cost: \$30.00 (PLEASE REGISTER EARLY; see the introduction to Coming Events for information.)

When weather conditions are favourable, the spectacle of thousands of hawks migrating over Derby Hill, New York, is an amazing phenomenon well worth the long bus ride. Please bring proof of citizenship for entry into the United States. Optical equipment in new condition should be registered with Canada Customs in advance of the trip. The excursion will be cancelled on the day before if the weather forecast for the eastern end of Lake Ontario is particularly unfavourable. You will be notified of any change of plan. Transportation will be by a comfortable motorcoach equipped with washroom.

Attention, all Members!

Membership fees for the year 2000 are now due. Please renew promptly; later renewals entail extra work and add to your Club's expenses. We would like to keep our mailing list up to date so that members do not miss a copy of *Trail & Landscape*.

ANY ARTICLES FOR TRAIL & LANDSCAPE?

Have you been on an interesting field trip or made some unusual observations recently? Is there a colony of rare plants or a nesting site that needs protection? Write up your thoughts and send them to *Trail & Landscape*. We can accept e-mail, IBM-compatible diskettes, or submissions in traditional form—typed, written, printed or painted!

URL of our site:

<http://www.achilles.net/ofnc/index.htm>



WEBMASTER's e-mail
ofnc@achilles.net

DEADLINE: Material intended for the April- June 2000 issue must be in the editor's hands by February 1st 2000. Mail your manuscripts to:

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